SAMPLE COHORT REPORT — FOR HEADS OF DEPARTMENT

What a FundaFirst HS Motion Foundations Diagnostic Reveals

Three findings from a 25-student IB DP Physics cohort

Sample cohort: 25 students · IB DP Physics
School: XYZ International School, Oceania
Diagnostic run: May 2026 · **Turnaround:** 48 hours
Cohort mean: 17.5/24 (73%) · **Range:** 11–23

The Motion Foundations diagnostic is a 25-minute, 24-question instrument that surfaces eight kinematics misconception bands grounded in Physics Education Research (Knight, Arons, Trowbridge–McDermott, Moore, Chabay–Sherwood). It identifies *where* conceptual understanding is brittle — not just *whether* students are getting questions right. The three findings below are the kind of diagnostic depth your department would receive.

Three findings from this cohort

1

54% cohort mean on x–t graph interpretation — the two weakest items in the diagnostic sit here

A foundational gap that ordinary assessment can easily miss. Students are reading position–time graphs as literal pictures of the path rather than as representations of position against time. Just 32% correctly read a diagonal x–t segment, and 40% recognise that a vertical segment is impossible — both reward treating the graph's shape as a spatial trajectory. The cohort handles the computation underlying the graphs well; the gap is in what a graph represents, not in the arithmetic.

2

59% cohort mean on velocity sign and direction

Speed and velocity are being treated as interchangeable. Only about half the cohort reads the sign of a velocity as its direction: 52% on the meaning of a negative velocity, and 52% on what happens to velocity when an object reverses direction at constant speed. Most of the cohort accepts that two objects can share a speed yet differ in velocity (72%); what slips is reading the sign itself as direction.

3

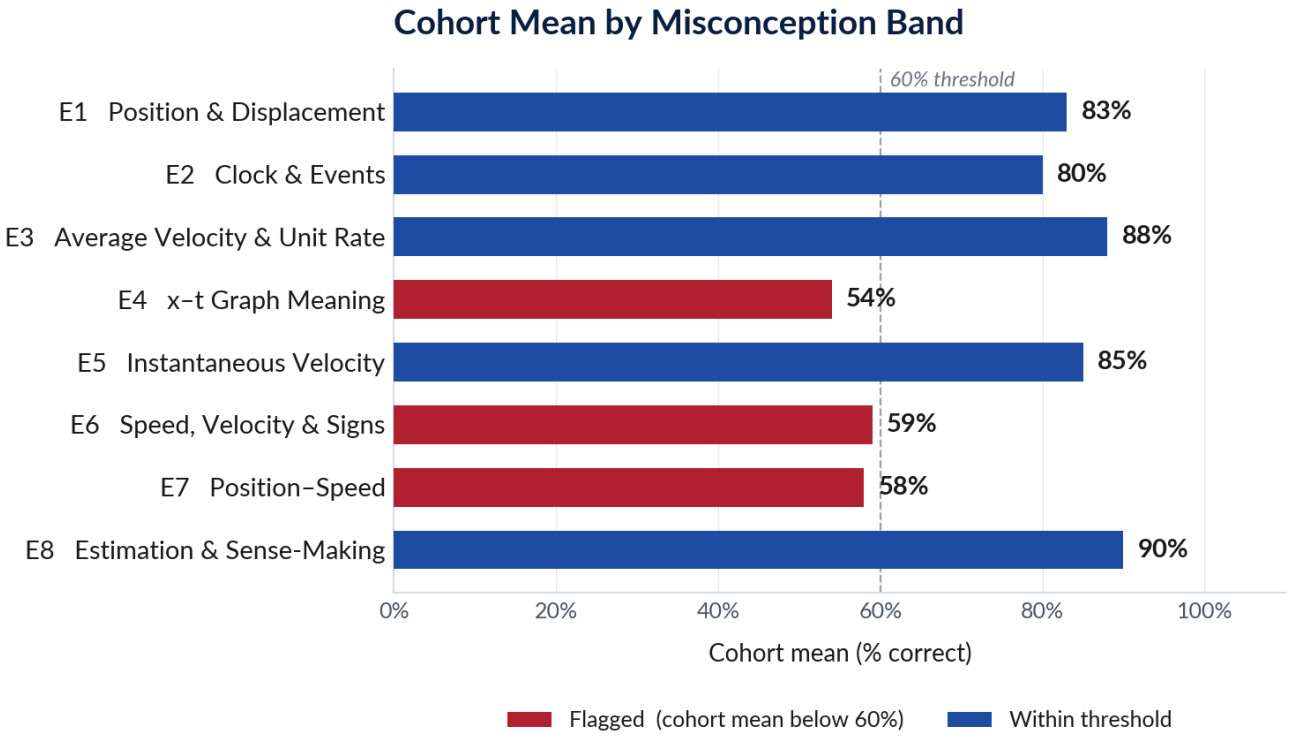
58% cohort mean on position–speed discrimination

A classic, well-documented confusion (Trowbridge–McDermott): students infer speed from position. Asked whether two objects at the same point are moving at the same speed, roughly four in ten of the cohort answer "yes" — reading "same position" as "same speed." This sits alongside the velocity-sign gap above: that gap conflates speed with velocity, this one reads speed off position — both are failures to keep speed and velocity as distinct quantities.

Visual Evidence

The diagnostic places every student into one of four performance bands and resolves performance into eight misconception bands.

The chart below shows the cohort mean on each of the eight Motion Foundations misconception bands. Bands where the cohort mean falls below 60% are flagged for targeted work; the rest sit within threshold.



Reading the chart: three bands fall below the 60% threshold — E4 (x–t Graph Meaning) at 54%, the cohort's largest and weakest band, and the linked pair E6 (Speed, Velocity & Signs) at 59% and E7 (Position–Speed) at 58%. The remaining five bands sit comfortably above threshold, which lets the department focus remediation tightly on graph interpretation and the speed-and-velocity bands rather than redesigning the whole unit.

What This Enables for the Department

Diagnostic depth, targeted remediation, and evidence for curriculum review.

Targeted remediation, not blanket re-teaching

The diagnostic identifies specific misconception bands and prescribes specific remediation items. In this cohort, the toolkit's Section E4 maps directly to the 54% graph band; the teacher does not re-teach kinematics; they fix the specific picture-versus-representation confusion the cohort missed. The result is concentrated classroom time on the actual gap, rather than distributed re-teaching across material the cohort already knows.

Evidence for HoD and curriculum coordinator review

Each cohort summary is structured for aggregation — band distributions, mean scores, and misconception patterns can be compared across cohorts, year groups, or curricula. The diagnostic becomes a longitudinal evidence source for department review: are particular topics consistently weaker year-over-year, are interventions actually shifting misconception patterns, and where should curriculum redesign focus?

A complete teacher action package

Every diagnostic delivery includes the heatmap, a 2-page cohort summary with prescription, a Mistake Museum (eight named misconceptions with student-side framings), Words That Hurt (eight phrases for teachers to retire), the Remediation Worksheet (35 items across 8 sections), and the Teacher Answer Key (solutions plus the diagnostic logic for each item). Teachers do not design remediation from scratch; they assign the targeted sections the heatmap flags.

Pilot model

FF HS diagnostics are currently running as free pilots — we deliver the diagnostic, score it, and produce the cohort summary within 48 hours of receiving completed student responses. The pilot includes the full teacher action package.

See how this would work with your students.

Visit **fundafirsths.com** to schedule a pilot for your physics department, or write to **admin@fundafirsths.com** with cohort details.

This is a sample illustrative report. The data shown reflects a representative IB DP Physics cohort pattern. No real school or student is depicted. The structure, depth, and style of recommendations are identical to what your school would receive after running the diagnostic.